

## CLAIMS

What is claimed is:

- 1 1. A method of failover in a cluster having one or more cluster nodes, comprising:  
2 providing a second server operative with said cluster;  
3 detecting a failed process on one of said cluster nodes; and  
4 duplicating said process on a virtual node on said second server;  
5 wherein said process is resumed on said virtual node.
- 1 2. The method of claim 1, wherein said second server is a failover server.
- 1 3. The method of claim 1, wherein said second server is a backup server.
- 1 4. A system comprising:  
2 a cluster, said cluster composed of one or more cluster nodes, each of said cluster nodes  
3 constructed and arranged to execute at least one process; and  
4 a second server, said second server operative with said cluster, said second server having  
5 one or more virtual nodes, each of said virtual nodes being constructed and arranged to execute  
6 said process of said one or more cluster nodes;  
7 wherein if one or more of said cluster nodes fails, then said process of said failed cluster  
8 node is transferred to one of said virtual nodes of said second server.
- 1 5. The system of claim 4, wherein said second server is a failover server.
- 1 6. The system of claim 4, wherein said second server is a backup server.

1 7. The system of claim 4 further comprising a third server, said third server operative with  
2 said second server, said third server having one or more virtual nodes, each of said virtual nodes  
3 being constructed and arranged to execute the instructions of one or more virtual nodes of said  
4 second server.

1 8. The system of claim 7, wherein said second server is a failover server and said third  
2 server is a backup server.

1 9. A system comprising:

2 a cluster, said cluster composed of one or more cluster nodes, each of said cluster nodes  
3 constructed and arranged to execute one or more processes;

4 a distributed cluster manager operative with each of said cluster nodes, said distributed  
5 cluster manager constructed and arranged to detect failure of said one or more processes on said  
6 one or more cluster nodes; and

7 a second server, said second server operative with said distributed cluster manager, said  
8 second server having a dynamic virtual failover layer operative with said distributed cluster  
9 manager, said second server further having one or more virtual nodes operative with said  
10 dynamic virtual failover layer, each of said virtual nodes being constructed and arranged to  
11 execute said one or more processes of said one or more cluster nodes;

12 wherein if one or more of said cluster nodes fails, then said one or more processes of said  
13 failed cluster node are transferred to one of said virtual nodes of said second server.

- 1    10.    The system of claim 9 further comprising:  
2            a third server, said third server operative with said distributed cluster manager, said third  
3    server having a dynamic virtual failover layer operative with said distributed cluster manager,  
4    said third server further having one or more virtual nodes operative with said dynamic virtual  
5    failover layer of said third server, each of said virtual nodes of said third server being constructed  
6    and arranged to execute said one or more processes of said one or more cluster nodes.
- 1    11.    The system of claim 9, wherein said second server is a failover server.
- 1    12.    The system of claim 10, wherein said second server is a failover server.
- 1    13.    The system of claim 10, wherein said third server is a backup server.
- 1    14.    An apparatus composed of one or more cluster nodes having at least one computer, said  
2    computer having at least one microprocessor and memory capable of executing one or more  
3    processes, said apparatus further comprising:  
4            a second server, said second server operative with said cluster, said second server having  
5    one or more virtual nodes, each of said virtual nodes being constructed and arranged to execute  
6    said process of said one or more cluster nodes;  
7            wherein if one or more of said cluster nodes fails, then said process of said failed cluster  
8    node is transferred to one of said virtual nodes of said second server.
- 1    15.    The apparatus of claim 14, wherein said second server is a failover server.
- 1    16.    The apparatus of claim 14, wherein said second server is a backup server.

1 17. The apparatus of claim 14 further comprising a third server, said third server operative  
2 with said second server, said third server having one or more virtual nodes, each of said virtual  
3 nodes being constructed and arranged to execute the instructions of one or more virtual nodes of  
4 said second server.

1 18. The apparatus of claim 17, wherein said second server is a failover server and said third  
2 server is a backup server.

1 19. An apparatus having a cluster, said cluster composed of one or more cluster nodes, each  
2 of said cluster nodes having one or more microprocessors and memory, said nodes constructed  
3 and arranged to execute one or more processes, said apparatus further comprising:

4 a distributed cluster manager operative with each of said cluster nodes, said distributed  
5 cluster manager constructed and arranged to detect failure of said one or more processes on said  
6 one or more cluster nodes; and

7 a second server, said second server operative with said distributed cluster manager, said  
8 second server having a dynamic virtual failover layer operative with said distributed cluster  
9 manager, said second server further having one or more virtual nodes operative with said  
10 dynamic virtual failover layer, each of said virtual nodes being constructed and arranged to  
11 execute said one or more processes of said one or more cluster nodes;

12 wherein if one or more of said cluster nodes fails, then said one or more processes of said  
13 failed cluster node are transferred to one of said virtual nodes of said second server.

1    20.    The apparatus of claim 19 further comprising:  
2            a third server, said third server operative with said distributed cluster manager, said third  
3    server having a dynamic virtual failover layer operative with said distributed cluster manager,  
4    said third server further having one or more virtual nodes operative with said dynamic virtual  
5    failover layer of said third server, each of said virtual nodes of said third server being constructed  
6    and arranged to execute said one or more processes of said one or more cluster nodes.

1    21.    The apparatus of claim 19, wherein said second server is a failover server.

1    22.    The apparatus of claim 20, wherein said second server is a failover server.

1    23.    The apparatus of claim 20, wherein said third server is a backup server.